



NMCI Service Level Agreements

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NMCI Liaison Officer, USMC
20 February 2003

Agenda



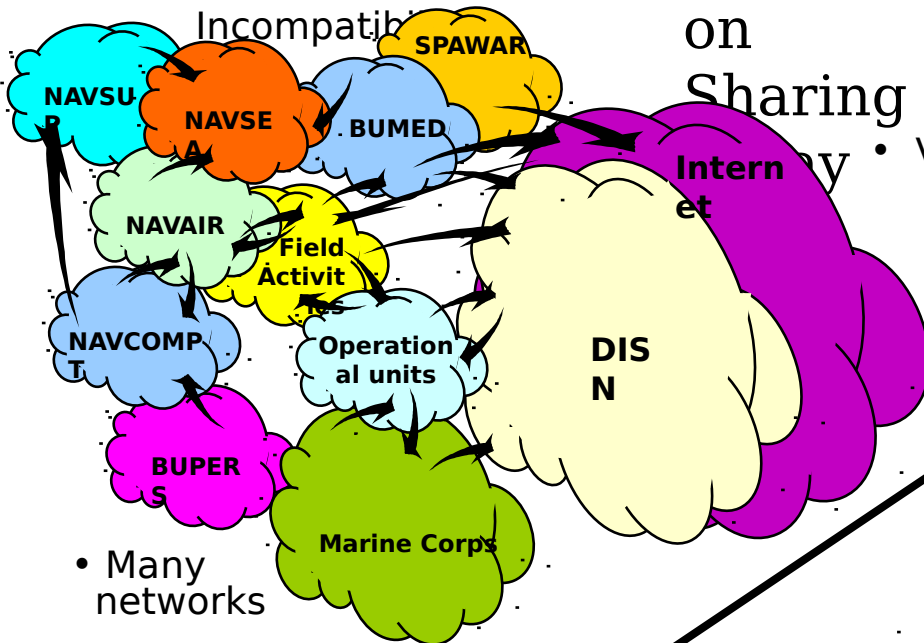
- **NMCI Fundamentals**
- **SLA Measurement**
- **SLA Details**
- **SLA Changes**
- **Lessons Learned**

NMCI Fundamentals

Why NMCI? - Navy

Information Sharing

- Inadequate Enterprise Interoperability



- Many networks
- Security concerns
- Uneven capability

Internet

- Vulnerability

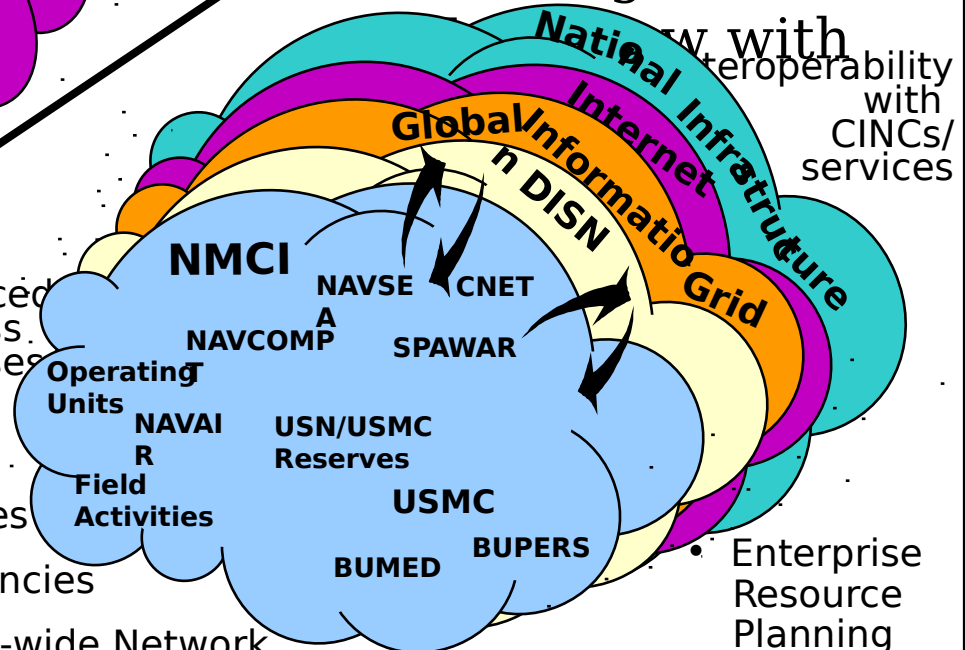
- Enhanced business processes

- Converged voice, video, & data services

- Increased business efficiencies

- Coherent DON-wide Network

Information Sharing



- Enterprise Resource Planning

Why NMCI? - USMC



27 August 2001

Dear Mr. Chairman,


I am writing this letter to assure you and the members of the committee that the Marine Corps is committed to the Navy Marine Corps Intranet (NMCI) initiative. We are scheduled to transition to NMCI during the third and fourth quarters of FY-02 and have programmed our budget to support this transition. Any exclusion of the Marine Corps from NMCI would exacerbate the degraded condition of our information technology infrastructure that has not been modernized for almost two years awaiting NMCI.

We have recently updated our affordability analysis for NMCI and under the present conditions of the contract we are confident that it is affordable for the Marine Corps. We are concerned, however, by the potential of an increased cost burden resulting from the required use of the Defense Information Systems Network (DISN), and we will continue to work closely with the Department of the Navy to resolve that issue.

I hope this information is helpful with regard to the Marine Corps' position on NMCI and, of course, I stand ready to answer any questions you or your colleagues may have. I am providing a copy of this correspondence to Congressman Skelton and am writing similar letters to the Chairman and Ranking Member of the Senate Armed Services Committee.

Thank you for your continued support of your Corps of Marines.

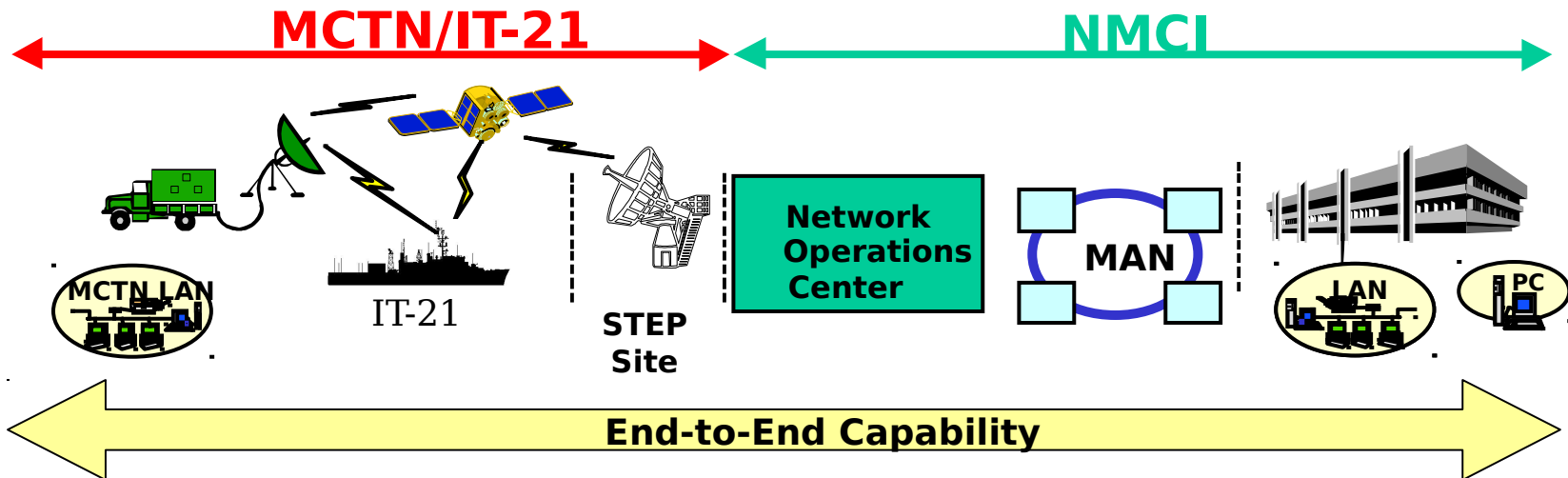
Semper Fidelis,


JAMES L. JONES
General, U.S. Marine Corps
Commandant of the Marine Corps

The Honorable Bob Stump
Chairman, Committee on
Armed Services
U.S. House of Representatives
Washington, DC 20515

- **IT seat management works in industry**
 - General Motors
 - Xerox
- **Successful in government**
 - NASA ODIN
- **Many providers were available**
 - Few had the experience on an NMCI scale
- **RFI issued to gather the best ideas**
- **SLAs set the standard for performance**

End to End Service



MCTN is:

- Marine Corps tactical network
- Deployable ashore
- Interface with IT21 and DISN
- Multiple transports (GMF, Triband, FleetSATCOM, terrestrial systems)
- Connects to Standard Tactical Entry Points/teleports

IT21 is:

- Shipboard LANs
- Ship to shore radio terminals
- Space segment (for SATCOM)
- Shore gateways

NMCI is:

- A Service
- Seat Management Concept
- Fleet Base/Local Area Networks to be provided
- Desk to Desk Management
- PCs & Enterprise-wide software
- Help Desks
- WANs / MANS

NMCI Balance

• USER

Customer Satisfaction is optimized when quality of service and cost/unit of service are balanced. Best Value Achieved.

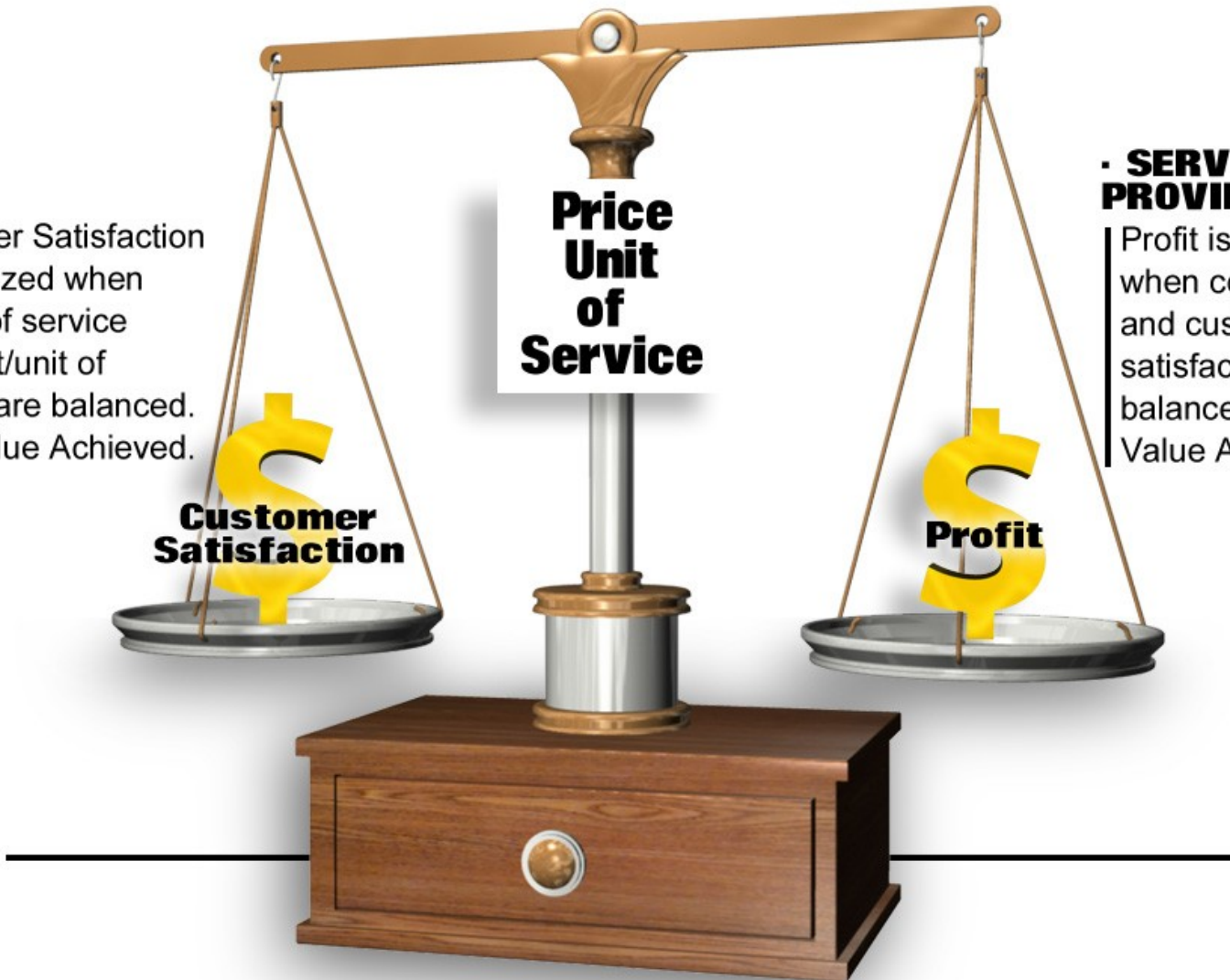
Customer Satisfaction

**Price
Unit
of
Service**

• SERVICE PROVIDER

Profit is optimized when cost/unit and customer satisfaction are balanced. Best Value Achieved.

Profit



NMCI Contract Basics

- **Contract Award 6 Oct 00 to Electronic Data Systems Corporation (EDS)**
 - **Information Strike Force (ISF) - EDS is Prime, Raytheon, CISCO, WorldCom, Dell, Microsoft, Wam!Net and 1st Tier small business subcontractors are strategic partners**
- **Commercial Contract Clause (FAR part 12)**
- **Indefinite Delivery/Indefinite Quantity (IDIQ)**
- **Firm Fixed Price (FFP)**
- **7 year base with 3 year option period (multi-year)**
- **Contract Minimum amount \$9.1 Billion over 10 years**
- **Incentive Award (Up to \$164.5M / year)**
- **Service Level Agreements - 45 SLAs with multiple metrics in each**

**Performance Based Services - Not a H/W - S/W
Procurement**

Service Level Agreements

- **SLAs apply to CLINS and reference the SOO**
- **Over 190 discrete metrics**
- **Describe the services in detail and**
 - What is measured
 - How it is measured
 - Who measures it
 - When and how it is reported
 - How much we want
- **Design and performance SLAs included**
- **Customer Satisfaction a key goal**
- *Influence full payment, incentives, and credits*

The HEART of the contract!!!!

SLAs Influenced Technical Design



- **Network availability (many 9's)**
 - Requires redundancy to meet
- **File transfer performance ($1\text{MB} \leq 2 \text{ sec}$)**
 - Flat network w/ minimal hops required
- **Latency & Packet Loss ($\leq 100\text{ms}$, $\leq 1\%$)**
 - High speed, minimal hops,
- **Average B/W utilization ($\leq 40\%$)**
 - Surge capacity of X 2.5
 - Bandwidth on demand
- **Problem Resolution (\leq days/hours/minutes)**
 - Distributed management, centralized configuration control

Validation of design being evaluated in current performance

SLAs and Payment



■ 5.9 - Full Payment Clause

- All SLAs must be met for 100% payment
- Provides incentive to contractor to:
 - Speed transition from legacy to NMCI
 - Stabilize the environment quickly
 - Provide all contract services upfront
- Congressional mandate for performance

■ 6.14 - Incentives

- Small Business: \$1.25M/yr
- IA: \$10M/yr
- FOC: \$10M
- Customer Satisfaction: Up to \$100.00/seat/QTR

■ 6.15.1 Credit for Service Downtime

- SLIP Plan – EDS construct

SLAs compliment the rest of the contract

SLA Measurement

Knowing the Details

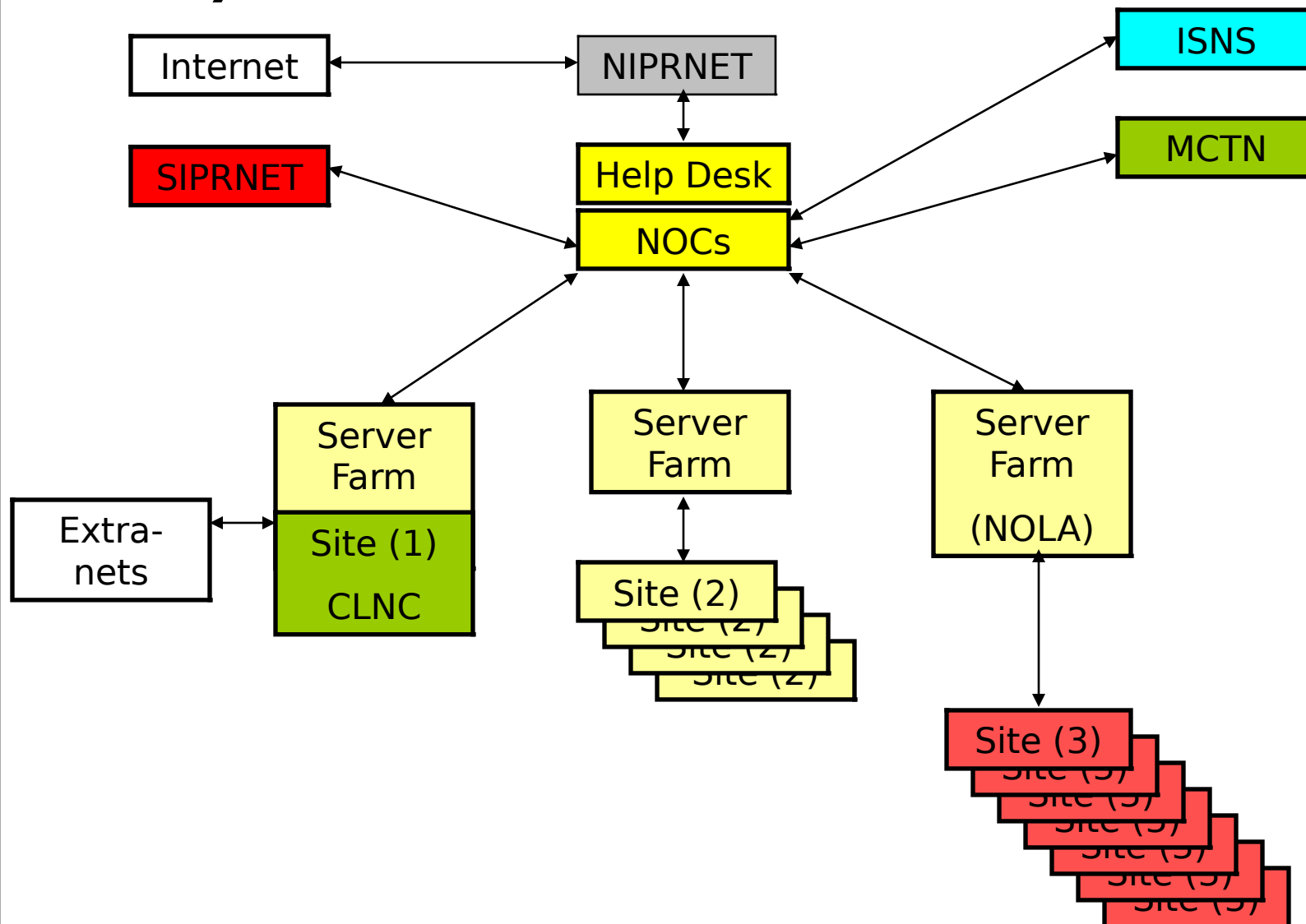


■ SLA measurement is more science than art

- Data Origin
 - Definition and range of acceptable values
- Data Collection
 - Tools and their configurations, data way-points
- Data Analysis
 - Scoring – How done? What constitutes success?
- Data Aggregation
 - What level is the data rolled up to – Site, Enterprise?
- Data Reporting
 - Who, how, when is the report passed to PM, KO?
- Data Display
 - Format, how is it provided to the government?

First four automated, last two under development

NMCI Architecture (High Level)



SLA Reporting Inputs



■ EDS Measurement

- Enterprise Management System (EMS)
 - Functions include: Distributed Monitoring, Remote Control, Even Management, Performance Management, Inventory Control, Software Distribution, Help Desk, SLA Reporting
- Manual data collection
 - Initially implemented in some cases
 - Will eventually move to augmentation of automated collection efforts
- 75% of current measurement processes fully automated

■ Government Measurement

- Mostly in the form of audits
- Primary measurement for Information Assurance (IA)

■ Joint Measurement

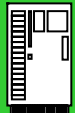
- Both parties have serial inputs (PKI)
- Particularly Intranet and WAN – 2 service providers

Enterprise Management System (EMS)

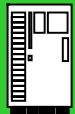
Feb 03



Event Management

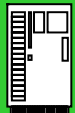


TEC
Tivoli Event Management



Cisco Works
Network Management

PHASE 2



NetView
Systems Management

Tivoli Event Console



Server Farm



File & Print
Server

MS Exchange
Server

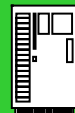


Web
Server

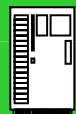


Domain
Controller

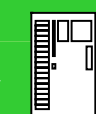
Tivoli
Framework



Server Gateway
SUN e420



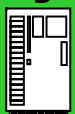
Tivoli Hub
SUN e420



Tivoli Spoke
SUN e420

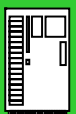
PHASE 1

Distribut
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ing



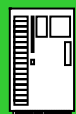
SUN
e420

Remot
e Control



SUN
e420

Enterpri
se Queue



SUN
e420

Inventor
y



SUN
e420

TAPM
PHASE 2



Dell
Win2
k

Novadig
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Software
Distributio



Dell
Win2
k

PHASE 1

NMCI Seat

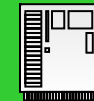


(Endpoints)



Client Gateway
Win2k

Incident
Management

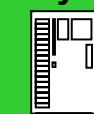


Avaya
ACD



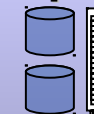
Help Des

Remed
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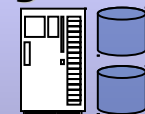


SUN
e6500

SLA
Reporting



Tivoli
e4500

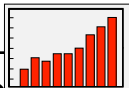


Report
e4500

Business
Objects



Output



SLA Reporting Outputs



■ NMCI SLA Website

- Needs revamping – current format very cumbersome

■ Current SLA performance provided (JAN03_022403.xls)

- January 03 performance results
- Spreadsheet format
 - Designed for testing events – somewhat limited
- Conversion to DB format needed
 - Scalability
 - Contribute to tailored claimant-command reporting
 - Feed invoicing validation and crediting system

■ Daily Operational Reports Available

- NOC management statistics and Network Operations Display (CLIN 30)

■ Building of invoicing - crediting system?

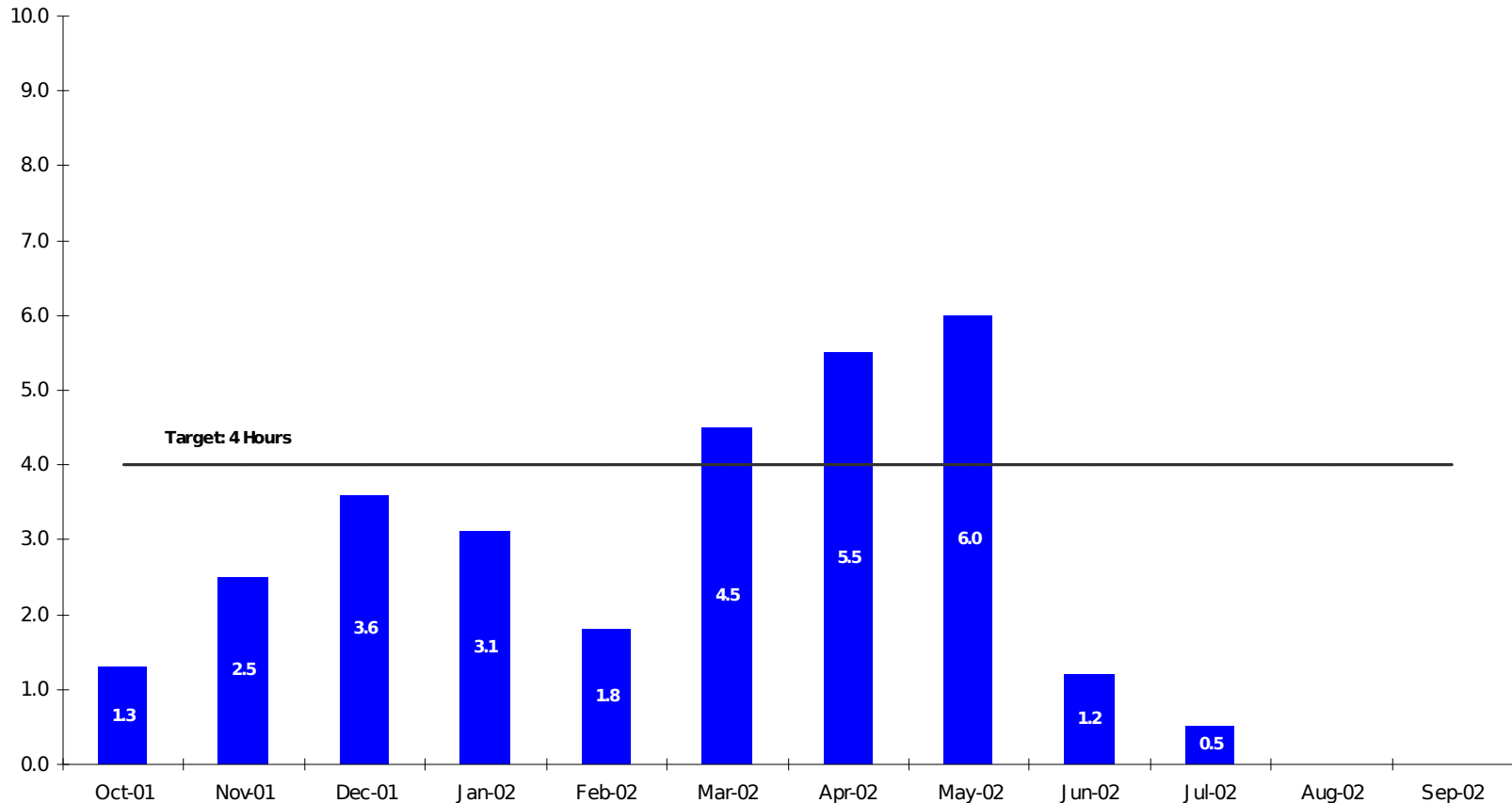
- No joint development yet
- Integration with NOIS and e-market place?
- Ease of use and validation required

SLA Website Report Formats



SLA 1-3: Hardware Problem Resolution - Mission Critical

Average repair time for workstating and/or operating system; based on Help Desk tickets.



SLA Details

Fitting the Performance Goals



- **One homogenous enterprise network**
 - The “same feel” everywhere reduces training, stabilizes expectations and costs, and standardizes performance

- **NMCI SLAs emphasis:**
 - Security
 - Reliability
 - End-to-end performance
 - Interoperability
 - Customer satisfaction
 - Conformance with DoD and DON policy
 - Beneficial Requirements

**NMCI will facilitate network
convergence**

- **Contractor designs, government approves the technical solution**
- **Joint measurement responsibilities**
- **Navy:**
 - DAA – COMNETWARCOM, Norfolk, VA
 - Green Team - SPAWAR PMW 161
 - Accreditation and configuration
 - Red Team - Fleet Information Warfare Center (FIWC)
 - Active probing / hacking of the network
- **USMC:**
 - DAA – Director CM Div, HQMC, C4, Washington DC
 - Green Team – MARFORINO, MITNOC, Quantico, VA
 - Red Team – May team with FIWC - TBD

Number 1 Priority

Security (Cont.)



■ IA SLA Components

- SLA 19 - Classified Remote Access
 - Ao, Capacity, Performance
 - Scaleable solution difficult to find
- SLA 33 - IA Services General
 - Accreditation, configuration, physical inspection, active defense
- SLA 34 - IA Services PKI
 - Compliance with DOD standards
 - Certificate revocation/validation, Obtain x.509 cert, Registration
- SLA 35 - SIPRNET
 - Ao
- SLA 36 - IA Planning Services
 - Awareness, currency and remediation
 - Incident Reporting / Response, I/A Product Refresh, Remediation

■ Different thresholds for UNCLASS / Classified

Limited measurement accomplished, mixed results

Reliability - Availability



■ 24 PCs describe Availability

- Desktop environment
- End user services
 - Primarily of the network server
Fail over of enterprise services
 - Network Access
Primarily of the network Portals

■ Increasing levels of performance for a price

- Basic, High End, Mission Critical Level of Service (LOS)
- LOS and Infrastructure
 - Possible negotiations to set minimum level of high LOS seats

■ Aggregation is either at the Server

F Performance for Ao has been consistently above target

Availability, what the “9’s” mean



| Target % | Down-time in a month | Down-time in a year |
|----------|----------------------|-----------------------|
| 99.9999 | 0.0438 min | 0.00876 hrs (.52 min) |
| 99.999 | 0.438 min | 0.0876 hrs (5.2 min) |
| 99.99 | 4.38 min | 0.876 hrs (52 min) |
| 99.9 | 43.8 min | 8.76 hrs |
| 99.8 | 86.4 min | 17.52 hrs |
| 99.7 | 131.4 min | 26.28 hrs |
| 99.6 | 175.2 min | 35.04 hrs |
| 99.5 | 219.0 min | 43.8 hrs |
| 99.0 | 438.0 min | 87.6 hrs |

Reliability - Responsiveness



■ **Basic Help Desk - SLA 23**

- One Help Desk system (REMEDY), 2 locations (San Diego, Norfolk)
- Integrated with GNOC
- Contact by phone, E-mail, FAX
 - Only contact by phone has associated SLA metrics
 - Working on DSN access for OCONUS & deployed users

■ **Most are aggregated at Enterprise level**

- Average Time to Respond – Prime and Non-Prime Time
- % of calls answered within Average Period – Prime and Non-Prime Time
- % of Calls Abandoned, <7%
- Create User Accounts, < 1 day 95% (site level)
- Password Resets, < 2 hours 95% (site level)
- Compliance w/ Escalation Procedure
- Customer Satisfaction – separate survey
- User Notification of unplanned outage

■ **Only tickets that are created count toward SLAs!!!!**

Contact the Help Desk when there is a problem

Reliability - Problem Resolution



■ Measured by Help Desk Trouble Tickets

- Internal Tickets – Distributed monitoring and remote control of network infrastructure, Tivoli TEC, WorldCom, DISA reporting
- External Tickets – User initiated
- Parent Tickets – large scale problems affecting < 20 users
- Child Tickets – repeat reports of the same problem, traceable to a known root-cause (server outage)

■ Restoration of service to the End User

- Measured in units of time (Business Day, Hours, Minutes)
- All aggregated by site
- Many end user services don't have a PR component – will fix in SLA mod

■ Performance trends

- “Infrastructure” is restored within targets
- “Hands-On” repair is generally not done within targets
- The bigger the base, the lower the performance

Reliability - Network Change



■ Moves, Adds and Changes - SLA 15

- Measured by site
 - Timeliness - target average < 4 days (Remote Users < 6 days)
 - Performance - target 96 % completed < 4 days
 - Government Operational Direction - rarely used
 - Customer Satisfaction - Separate Survey - not taken yet

■ Performance Trends

- Timeliness Improving, Performance consistently below target
- The bigger the base, the lower the performance
- Major MAC Contract Modification in negotiation
 - Government performs much of directory administration
 - Cost structure altered

■ Software Distribution and Upgrades - SLA 16

- Centralized, Distributed Distribution system (RADIA 3.0)
- Measured by Site
- S/W Back-outs, Upgrade and Patch Currency
- No solid measurement processes in place yet - **Major weakness**

Reliability - Network Change (cont.)



■ Asset Management (SLA 28)

- Measured by site
- Time to Implement (new) Asset, 92% in < 5 days ** (Remote users 85%)
- Time to Remove Asset, < 15 days (Remote users < 25 days)
- Accuracy of Asset Inventory, 99.5 % (audit)
- No measurement processes in place yet, **major operational impact**
- SOO Table 3.4.6 requires extensive monthly asset report – **demand it!**

■ Technology Refresh (SLA 36C)

- Infrastructure refreshed as often as necessary to meet SLAs
- Workstation Refreshment (<36 months)
- Relative Performance of Refreshed W/S (ESI renders this OBE)

■ System Services

- Operational Support Services SLA 29), Capacity Planning (SLA 30), Integration and Testing (SLA 36B), Sea-Shore Rotation (SLA 37)
 - Mostly administrative, long term, Enterprise measurements
 - Will likely move to another area of the contract

End-to-End Performance



■ External Network Access

- NIPRNET Access (SLA 11), Internet Access (SLA 12), SIPRNET Access (SLA 35), External Networks (as ordered by CLIN 29)
 - All measured at the network Portal at the NOCs

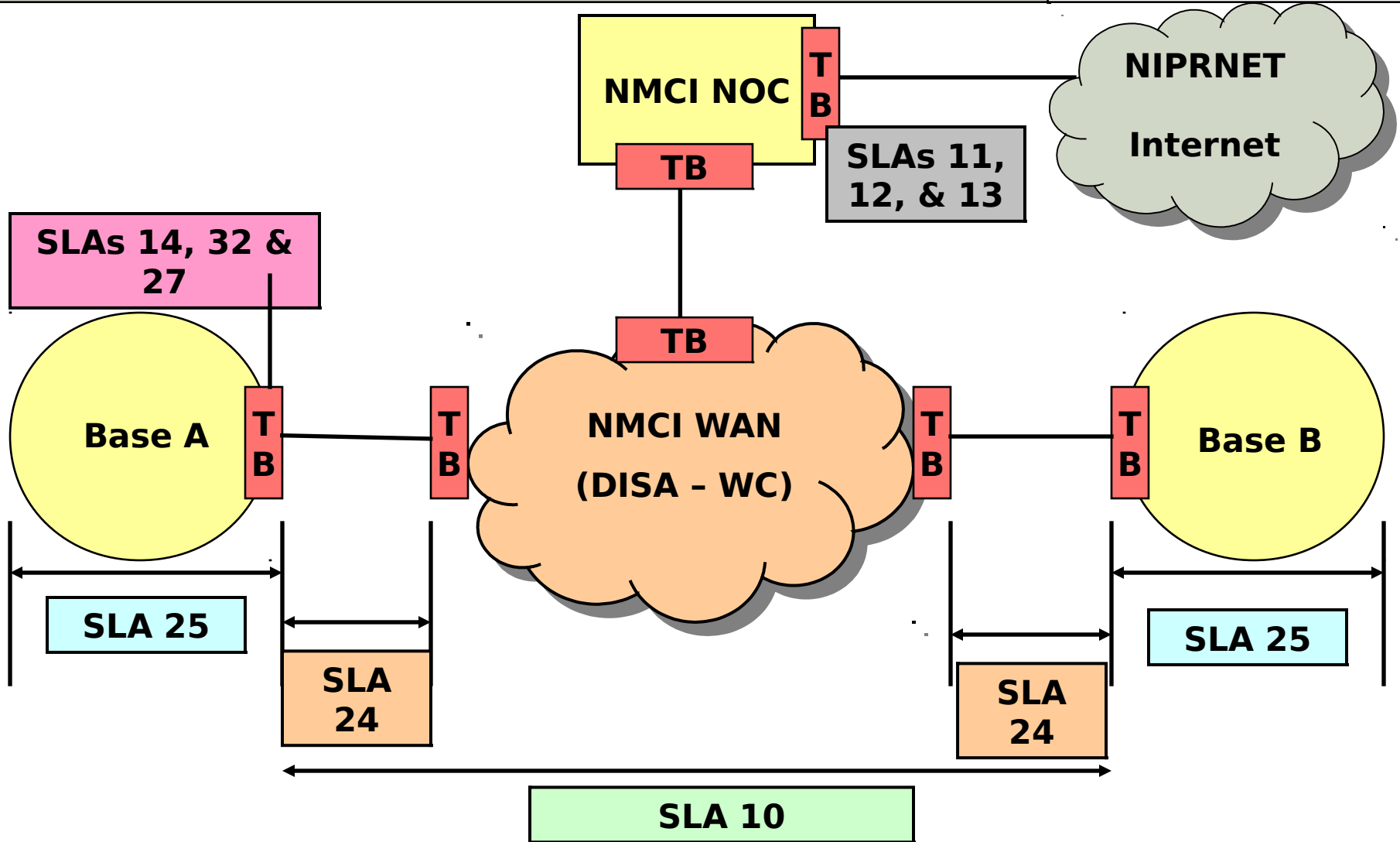
■ NMCI Network Access

- Multiple Network Measurements
 - Ao, Latency, Packet Loss, B/W Utilization, Problem Resolution
- Aggregate Measurements
- NMCI Intranet (SLA 10)
 - Base POP to Base POP
- WAN Access (SLA 24)
 - Base POP to WAN Access Portal (Tail Circuits)
- BAN/LAN (SLA 25)
 - Site Distribution Network
 - BAN - Core and Distribution Switches
 - LAN - Access Switches
- Remote Access Service (SLAs 18 & 19)
 - Service via WorldCom UUNET

CTR - Get involved in location of measured switches!!!

Performance Trend: Network is stable and reliable

Network SLA Measurement



End-to-End Performance (Cont.)



■ Application Latency

- Directory, Shared File, NMCI Web and DNS Performance
- Measured by automated network scripts running on end-user workstations at pre-scheduled, high usage times
- Most representative measurement of end user experience
- Measured by site – **CTR – Get involved in TAPM W/S assignment!!!!**

■ DMS (SLA 20A)

- First delivery in Jan 03, measurement process TBR

■ Mainframe Applications (SLA 13)

- No mainframes inside NMCI yet
- Currently measured to B2, B1 or DMS security layers
- Process for measuring by application in development

■ Desktop Access to Govt Applications (SLA 14)

- Only one GOTS App fully transitioned w/ servers inside NMCI
- Currently measured to B2, B1 or DMS security layers
- Process for measuring by application in development

Interoperability

■ 23 Interoperability SLAs

- All services (Office S/W, e-mail, DMS, voice)
- Most of OSI Layer 1-4
- Required for Joint war fighting mission
- Completely undefined at contract award
- Complete re-write accomplished May 01

■ 2 Phase Measurement Process

- I/O Monitoring Constellation
 - 6 Joint Locations
 - ACTIVE, Automated, continuous testing using TAPM-like scripts
- I/O Problem Reporting Application
 - User generated – quick, menu driven, “pop-up” application
- EDS balked at cost of Monitoring Constellation – Navy agreed
 - Installation of first pilot with U.S. Army ISEC (Ft. Huachuca, AZ)
- EDS balked at development of I/O user report app, instituted normal Help Desk reporting for I/O – Subjectivity a concern
 - NETWARC

Losing ground on I/O

Customer Satisfaction

■ 31 SLA PCs describe customer satisfaction

- Virtually every end user and network service
- Provides for continuous awareness of service delivery, trend analysis
- Web - Survey based
 - Incident follow-up to indicate location or service trends
 - Random sampling per quarter by location, command
- Many SLA C/S results appear invalid
- Major focus of SLA re-engineering effort

■ Overall NMCI Customer Satisfaction Survey

- Every data seat user gets a vote once per year
- Basis for biggest incentive award (~ \$140M/yr)
- 85% above average = \$25/seat/Qtr
- 90% above average = \$50/seat/Qtr
- 95% above average = \$100/seat/qtr

Performance influenced by the user

SLA Changes

- **P00041, April 02**

- Worked over 10 months
- Twenty Eight (28) changes to enhance “Performance Category Descriptions”
- Fifteen (15) changes to clarify PC “How Measured”
- Six (6) Changes to clarify “Performance Category Title” to make them more descriptive
- Six (6) beneficial changes to Contract SLA values
- One (1) change to PC “Who”
- One (1) change to clarify PC “Comments”
- One (1) PC Added (SLA 24-4A)
- One (1) PC deleted (SLA 31-3) DNS Usage

Administrative corrections and clarifications

Process enhancements

SLA Changes (Cont.)



■ P0005x, Dec 02

- 80 PCs considered
- Primarily clarifications based on understanding of service delivery and method of measurement
- Majority (85%+) requested by EDS
- Substantial changes to Information Assurance
 - Addresses joint performance responsibilities
 - Identifies limits of liability based on DAA risk acceptance
 - EMS reconfigured to measure per P00041 mod and P0005x agreements

■ More fundamental change contemplated

- Streamline SLAs, reduce complexity, emphasize performance
- Move admin SLAs to SOO, eliminate redundancy, group sm

Peripheral changes to get through DP-2

The Money SLAs



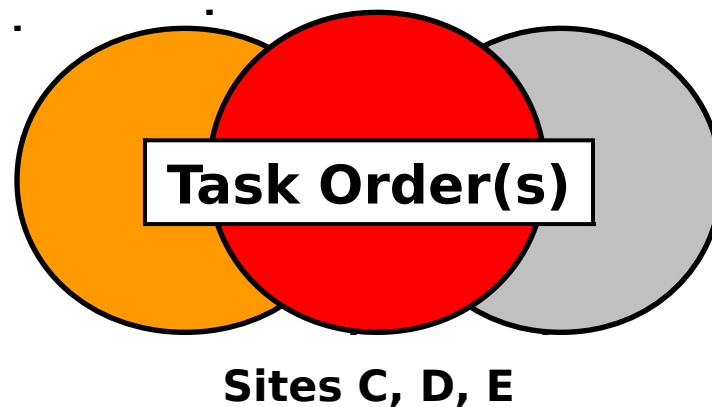
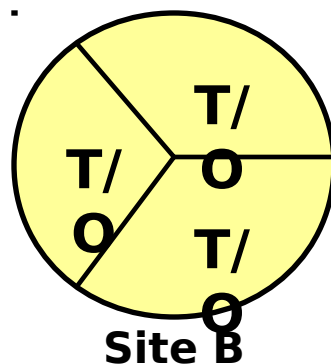
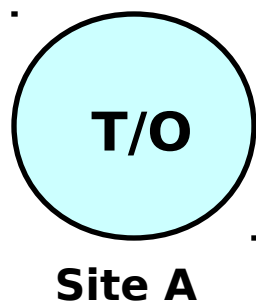
- **Technology refreshment period and performance**
- **Problem resolution time**
- **Help desk responsiveness**
 - First response %
 - Call abandonment rate
 - First pass resolution
- **Moves, adds and changes**
- **New and “unusual” CLINS**

Cost - Performance Trade-offs

Performance to Payment



- **SLA measurement is aggregated geographically**
 - Site, Server Farm, NOC, Enterprise
 - SLAs are reported in a monthly SLA Report
- **Services are requested and paid for by Task Orders**
 - CLINs: What, how many, where, when, who pays, cost data
 - Task Orders are entered in the NOIS system
- **Task Orders can include any combination of services**
 - NMCI Asset Management keeps track of installed services
- **An automated tool is required to associate the complex performance to payment calculations**



SLA Payment Tool Requirements

■ Flexibility

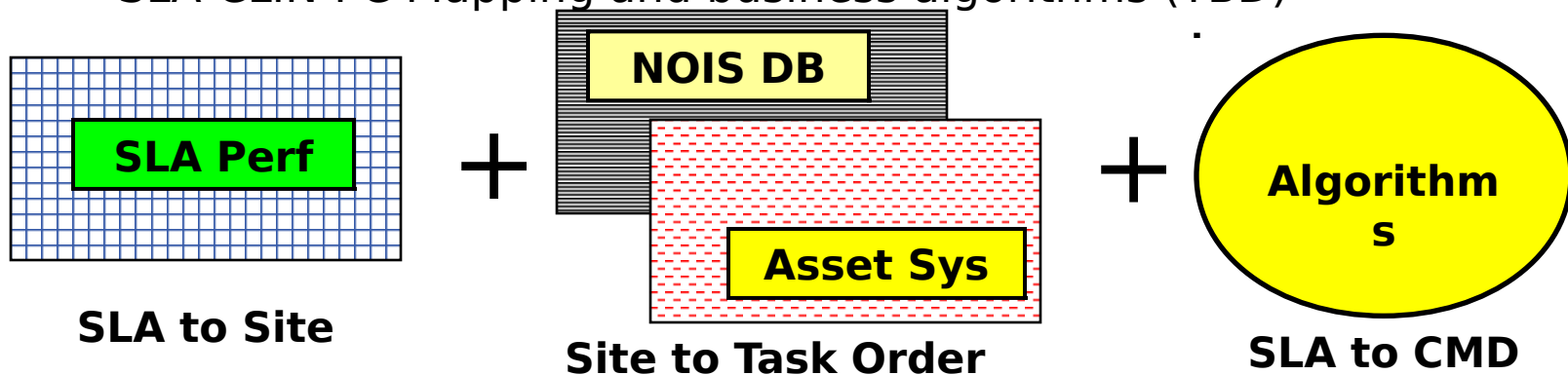
- Task Orders will change
- SLAs will change
- Information requirements will change

■ Ease of use

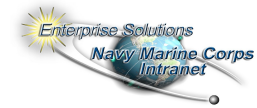
- Minimal data entry from central, authoritative sources
- Maximum value to Contract Admin personnel, Commands, Contractor
 - Invoice certifications, Tailored SLA reports, Credit calculations

■ Current data source integration

- NOIS Ordering System
- SLA Performance Reports
- NMCI Asset Management system (TBD)
- SLA-CLIN-PC Mapping and business algorithms (TBD)



Proving it to Yourself and Others



- Independent validation and verification (IV&V) shows that you're getting what you paid for
- Validation of SLA Measurement Processes
 - **In-depth examination of NMCI Enterprise Management System (EMS) to include:**
 - **ISF-Government understanding of the contract terms**
 - **ISF service model architecture and engineering**
 - Tool selection and configuration**
 - Roles and Responsibilities**
 - Timelines for activity and reporting**
 - Configuration and Change Management**
- Verification of SLA performance (This FY)
 - **Mid-long term strategy- Quarterly revalidation & testing**
 - **Based on configuration control of EMS**
 - **Scalable to government requirements and observed performance**

Congress and your customers are from Missouri

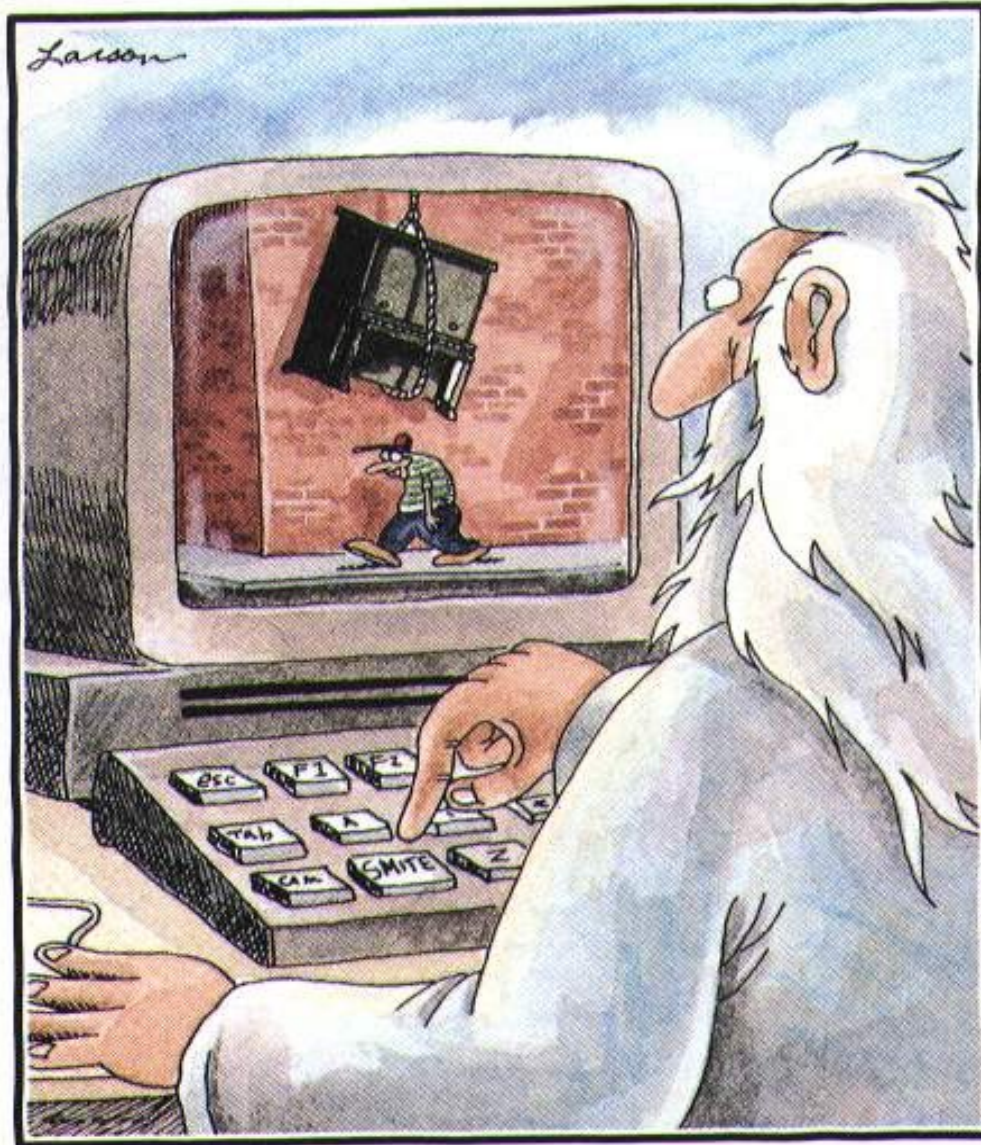
Cultural Adjustment

- **NMCI is a “services” contract, not a H/W**
 - **S/W procurement**
 - Control is centralized, not distributed
 - Change is deliberate because of the FFP
- **SLAs provide performance targets, not absolute limits**
 - 100% performance = 10,000% cost
- **Everyone will find an “angle” to exploit**
- **Education is the key to success**
 - Expectation management
 - Customer advocacy

Staying inside the box

SLA Lessons Learned

- **Know your requirements**
- **Keep your stakeholders involved**
- **SLAs must contribute to major goals**
- **Be specific without being definitive**
- **Fit all of the contract pieces together**
- **Do the math.....**
- **Take your time.....**
- **Build the proper tools**



God on NMCI

NMCI Information Sources



- **SPAWAR Contracts website**
 - www.nmci.spawar.navy.mil
 - THE OFFICIAL CONTRACT
- **USMC NMCI website**
 - <http://www.nmciinfo.usmc.mil/>
- **EDS website** www.eds.com/nmci
- **NMCI Customer Satisfaction Website**
 - http://www.eds-gov.com/nmci_survey/survey_gen.asp
- **SLA Website**
 - <http://www.nmci-eds.com/sla/index.asp>
- **Daily operational reports website**
 - http://www.nmci-eds.com/op_reports/index.asp

Questions and Answers